1852MNRAS..13...39H

1027 gave 2″·645. On going up to the observatory this evening, I observed *Mercury* very near the horizon, shining very brightly for his position. I watched him go behind the horizon as behind a transit-wire — very obvious one movement, gone the next. Such was the clearness of the atmosphere. *Canopus*, too, which has here only a meridian altitude of 1° 49′, including refraction, occasionally shines out with a brilliancy almost rivalling *Rigel*, although the latter is so far above him.

"Dec. 9. Remeasured the diameter of *Neptune* with 1027: mean =2″·774. The power, however, seemed rather too great for the circumstances.

"Dec. 20. Remeasured the diameter of *Neptune*, power 1027. The mean of six measures gave 2″·796.

"Dec. 22. Remeasured the diameter of *Neptune*. Mean of eight measures with 1027 gave 2″·450; mean of six measures with 219 gave 2″·710.

"Dec. 27. Mean of ten measures of diameter with 760 gave 2″·628. No stars or points of light visible within 4′ of the planet. Power 778. The measures of distance were obtained in very strong twilight.

"January 1, 1853. Remeasured the diameter of *Neptune*. Disk capital, and circumstances very favourable: mean of eight measures with 366 gave 3″·035; mean of five measures, power 614, gave 2″·774.

"The mean of all the measures of the planet's diameter is 2″·713. The difference of the various sets is greater than I should have expected; but there are many things which must influence the result, *e. g.* the state of atmosphere, the magnifying power, and the degree of illumination. As varieties of these have accompanied the measures, I hope this mean will not be far from the truth. The feeble light of the disk and its minuteness render its accurate measurement a task of great difficulty. The observations of the satellite, compared with former ones made at various periods, will, I believe, require a somewhat longer period than has been given, viz. about 5·8779 days.

"*Valetta, Jan.* 5, 1853."

On the Appearance of the Planet Saturn and his Rings, as viewed in Mr. Bishop's Refractor, 1853, *January 9th.* By Mr. Hind.

"The night of January 9th being one of unusual steadiness of definition with high powers, the planet *Saturn* was attentively examined, certainly under far more favourable conditions than at any previous date during the present winter.

"The dark ring was prominently visible under magnifiers of 108 and upwards to 460: it appeared to fill two-fifths of the space between the inner edge of the interior bright ring and the ball, being brightest near the former. Its colour was a light purple; of this point there could be no doubt. Nothing like a division in the obscure ring could be traced. During the most favourable glimpses there appeared to be a division on the exterior bright ring, rather outside the middle of its breadth, which might be traced, for some distance especially, on the eastern side of the ring. Such a division was distinctly seen at Mr. Bishop's observatory in the autumn of 1845.

"But the most evident of the newly-announced appearances connected with this planet was the visibility of the contour of the ball *through* the obscure ring where it crossed the disk of *Saturn*, as first remarked by Mr. Lassell and Captain Jacob. This phenomenon had been previously suspected on several occasions, yet

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1852MNRAS..13...40N

always under less advantageous circumstances than on the night of January 9. On former evenings, the contour only of the globe appeared, by momentary glimpses, to penetrate through the obscure ring; whereas, on January 9th, the appearance was such as to convey the idea that it was not merely the outline, but the whole surface traversed by the dark ring, which was visible through it.

"From observations last autumn, I had considered it very probable that the continuation of the outline of the ball through the obscure ring was an optical illusion, arising from the impression made upon the eye by the brightness of the ball in comparison with that of the ring; and though I conceive this explanation should not be hastily set aside, the results of the favourable examination on January 9th have rather shaken my confidence in it: the dark ring on this night certainly appeared to possess a *partial transparency*, which would account for the contour of the globe being perceptible up to the interior bright ring. It was impossible not to remark the much lighter (greyish) shade presented by the projection of the obscure ring upon the ball, as compared with the black shadow of the latter upon the further side of the bright rings.

"*South Villa Observatory, Jan.* 13, 1853."

Some Remarks on the probable present Condition of the Planets Jupiter and Saturn, in reference to Temperature, &c. By Mr. Nasmyth.

"The remarkable appearances which characterise the aspect of the planets *Jupiter* and *Saturn*, as revealed by the aid of very powerful and excellent telescopes, have induced some reflections on the subject of their probable present condition as to temperature, that with a view to excite more special and careful observation of the phenomenon in question, and promote some discussion on this interesting subject, I have been tempted to hazard the following remarks, which may perhaps prove acceptable to some of the members of the Royal Astronomical Society.

"In a former communication, in reference to the structure and condition of the lunar surface, I made some remarks on the principle which, as it appears to me, gives the law to the comparative rate of cooling of the masses of the planets, namely, that while the heat-retaining quality was due to the mass of the planet, the heat-dispensing quality was due or governed by its surface; and as the former increases as the cube of the diameter of the planet, while the latter increases only as the square of its diameter, we thus find that the length of time which would be required by such enormous planets as *Jupiter* and *Saturn* to cool down from their original molten and incandescent condition to such a temperature as would be fitted to permit their oceanic matter to permanently descend and rest upon their surface, would be vastly greater than in the case of such a planet as the earth.

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